

What is claimed is:

- Swk  
H1
- 09906299-112001
1. An ink-jet recording sheet comprising a first porous layer at the outermost position of the ink-jet recording sheet, wherein the ink-jet recording sheet satisfies the following Formula (1), when an aqueous solution, which comprises a water-soluble alcohol-type organic solvent having an SP value in an range of from 18.414 to 30.69 (MPa)<sup>1/2</sup> and a boiling point of not less than 120 °C in an amount of from 10 to 40% by weight, is provided to the surface of the ink-jet recording sheet in an amount of 20 ml/m<sup>2</sup>,

$$\text{Formula (1)} \quad V_c/V_d \leq 0.4$$

wherein  $V_c$  represents a water transition amount of a first area of the ink-jet recording sheet, where the aqueous solution is provided, during a contact time of 0.8 seconds when the first area is subjected to Bristow's Measurement, and  $V_d$  represents a water transition amount of a second area of the ink-jet recording sheet, where the aqueous solution is not provided, during a contact time of 0.8 seconds when the second area is subjected to Bristow's Measurement.

2. The ink-jet recording sheet of Claim 1, wherein the ink-jet recording sheet further satisfies the following Formula (2),

$$\text{Formula (2)} \quad V_{60}/V_d \geq 0.7$$

$V_d$  represents a water transition amount of the ink-jet recording sheet during a contact time of 0.8 second when the ink-jet recording sheet is subjected to Bristow's Measurement after being stored at 60 °C and 20 RH for 24 hours.

3. The ink-jet recording sheet of Claim 1, wherein the first porous layer comprises a water-insoluble organic fine particles, which is capable of being dissolved in or swelled by a water-soluble alcohol-type organic solvent having an SP value in a range of from 18.414 to 30.69 (MPa)<sup>1/2</sup> and a boiling point of 120 °C or more, as a primary component, and the ink-jet recording sheet further comprises a second porous layer comprising inorganic fine particles and a hydrophilic binder as a primary component.

0996699 112801

4. The ink-jet recording sheet of Claim 3, wherein a mean primary diameter of the water-insoluble organic fine particles is not more than 0.1  $\mu\text{m}$ .
5. The ink-jet recording sheet of Claim 3, wherein the ink-jet recording material comprises a non-water-absorptive support.
6. The ink-jet recording sheet of Claim 1, wherein the water-soluble alcohol-type organic solvent is diethylene glycol monobutyl ether.
7. The ink-jet recording sheet of Claim 6, wherein the first porous layer comprises water-insoluble organic fine particles, which is capable of being dissolved in or swelled by diethylene glycol monobutyl ether, as a primary component, and a mean primary diameter of the water-insoluble organic fine particles is not more than 0.1  $\mu\text{m}$ .
8. The ink-jet recording sheet of Claim 6, wherein the ink-jet recording sheet comprises a non-water-absorptive support.

0996299.13801  
TOP SECRET 6629550

9. The ink-jet recording sheet of Claim 1, wherein the first porous layer comprises organic fine grains as a primary component.
10. The ink-jet recording sheet of Claim 1, wherein the ink-jet recording sheet comprises a non-water-absorptive support.
11. An ink-jet recording sheet comprising an ink-absorbing layer having a first porous layer at the outermost position of the ink-absorbing layer, wherein the ink-absorbing layer comprises water-insoluble organic fine particles which is capable of being dissolved in or swelled by a water-soluble alcohol-type organic solvent having an SP value in a range of from 18.414 to 30.69 (MPa)<sup>1/2</sup> and a boiling point of not less than 120 °C.
12. The ink-jet recording sheet of Claim 11, wherein the first porous layer comprises the water-insoluble organic fine particles as a primary component.

13. The ink-jet recording sheet of Claim 12, wherein the ink-absorbing layer comprises a second porous layer contains inorganic fine particles and a hydrophilic binder as a primary component, and a thickness of the first porous layer is not more than 20% of the entire ink-absorbing layer and a thickness of the second porous layer is not less than 80% of the entire ink-absorbing layer.

14. An ink-jet recording method comprising steps of jetting an ink having a water-soluble dye, water and water soluble organic solvent onto an ink-jet recording sheet comprising a first porous layer at the outermost position of the ink-jet recording sheet in an amount of 10 to 35 ml/m<sup>2</sup>, and drying the at room temperature until reaching a constant state, wherein the ink and the ink-jet recording sheet satisfy the following Formula (3),

Formula (3)  $V_a/V_b \leq 0.4$

wherein  $V_a$  represents a water transition amount of a first area of the ink-jet recording sheet, where the ink is provided in said amount, during a contact time of 0.8 seconds when the first area is subjected to Bristow's Measurement, and  $V_b$  represents a water transition amount

0996699.112801

of a second area of the ink-jet recording sheet, where the ink is not provided, during a contact time of 0.8 seconds when the second area is subjected to Bristow's Measurement.

15. The ink-jet recording method of Claim 14, wherein the water-soluble organic solvent is a water-soluble alcohol-type organic solvent having an SP value in a range of from 18.414 to 30.69 (MPa)<sup>1/2</sup> and a boiling point of 120 °C or more, and the first porous layer comprises a water-insoluble organic fine particles which is capable of being dissolved in or swelled by the water-soluble alcohol-type organic solvent.

16. The ink-jet recording method of Claim 15, wherein the water-soluble alcohol-type organic solvent is triethylene glycol monobutyl ether.

17. An ink-jet recording method of jetting an ink comprising a water-soluble dye, water and a water-soluble alcohol-type organic solvent having an SP value in a range of from 18.414 to 30.69 (MPa)<sup>1/2</sup> and a boiling point of not

059906299-112001

less than 120 °C onto an ink-jet recording sheet comprising a first porous layer at the outermost position of the ink-jet recording sheet, wherein the first porous layer contains a water-insoluble organic fine particles, which is capable of being dissolved in or swelled by the water-soluble alcohol-type organic solvent, as a primary component.

18. The ink-jet recording method of Claim 17, wherein the water-soluble alcohol-type organic solvent is triethylene glycol monobutyl ether.

19. A method for preparing the ink-jet recording sheet of Claim 1 comprising steps of coating a coating solution comprising an organic fine particle emulsion, which satisfies the following Formula 4, and drying the coated solution,

Formula (4)  $T_0 \geq 60$  and  $T_{20} \leq 10$

wherein  $T_0$  is a minimum film forming temperature (in °C) of the organic fine particle emulsion and  $T_{20}$  is the minimum film forming temperature (in °C) of the organic fine particle emulsion when a hydrophilic organic solvent

099629-1201  
T022T 6629550

is added to the organic fine particles emulsion in and  
amount of 20 percent by weight of the organic fine  
particle emulsion.

0906299 112801  
FOUO T 6629660